AMENDMENT TO THE CLAIMS

Please amend the presently pending claims as follows:

1. (Currently Amended)   A method for the watermarking of a sequence of video images, implementing a step for the insertion of at least one watermarking bit into at least one motion vector obtained by motion estimation between two images of said sequence, so as to obtain at least one watermarked motion vector,

said motion vector being identified by its coordinates in a reference space, partitioned into two zones ~~types~~ of complementary types ~~zones~~, one zone surrounding the other zone, each zone having a distinct binary value associated with it,

said insertion step implementing, if necessary, a modification of the coordinates of the motion vector so that it is located in a binary value zone corresponding to said watermarking bit to be inserted,

wherein, during said modification, at least two potential watermarked motion vectors are determined and, from among said potential watermarked motion vectors, an optimal watermarked motion vector is selected according to at least one predetermined criterion, so that the modified coordinates of said motion vector are those of said optimal watermarked motion vector.

2. (Original)   A watermarking method according to claim 1, wherein said predetermined criterion is a criterion of invisibility of said watermarking.

3. (Original)   A watermarking method according to claim 1, wherein said reference space is associated with a reference grid comprising blocks of predetermined dimensions, each of said blocks comprising a zone of each of said types.

4. (Original)   A watermarking method according to claim 3 wherein, said motion vector is located in a reference block of said reference grid, said potential watermarked motion vectors are

searched for in a zone of said reference block having a binary value corresponding to said watermarking bit.

5. (Original)   A watermarking method according to claim 4, wherein said potential watermarked motion vectors are also searched for in a binary value zone corresponding to said watermarking bit, belonging to at least one block adjacent to said reference block.

6. (Original)   A watermarking method according to claim 4, wherein said potential watermarked motion vectors are all the motion vectors located in said searched zone.

7. (Original)   A watermarking method according to claim 1, wherein said predetermined criterion is a criterion of optimization of a peak signal-to-noise ratio (PSNR) associated with each of said potential watermarked motion vectors.

8. (Original)   A watermarking method according to claim 1, wherein, an image of said video sequence being associated with at least two hierarchical levels, said method implements a motion estimation on at least one pair of images of said sequence for at least one of said levels so as to determine a set of motion vectors of said level,

    and wherein the motion vectors of a higher hierarchical level are obtained by computing an average of the associated motion vectors in the lower level.

9. (Original)   A watermarking method according to claim 8 comprising a step for the selection, from among the motion vectors of the highest hierarchical level, of at least one motion vector at which said step for the insertion of a watermarking bit is implemented.

10. (Original) A watermarking method according to claim 9, wherein said modification of the coordinates of said selected motion vector is also applied to the corresponding motion vectors of at least one of said lower levels, so as to perform a redundant insertion of said watermarking bit.

11. (Original) A watermarking method according to claim 1, wherein said motion estimation is of the "block matching" type.

12. (Original) A watermarking method according to claim 1, also comprising a step of motion compensation based on said watermarked motion vector or vectors so as to generate a watermarked video image sequence.

13. (Original) A watermarking method according to claim 12, wherein each of said motion vectors being associated with a region of said image, said motion compensation is implemented on all the regions of said image, associated with watermarked or non-watermarked motion vectors.

14. (Original) A watermarking method according to claim 12 wherein, said motion vectors being each associated with a region of said image, said motion compensation is implemented in the region or regions of said image with which said watermarked motion vector or vectors are associated, and wherein an image of said watermarked video image sequence comprises said regions on which said motion compensation is implemented and at least one original region.

15. (Currently Amended)   A method for the extraction of a watermark from a video image sequence watermarked according to the method of claim 1, comprising a step for the extraction of at least one watermarking bit inserted into at least one watermarked motion vector,
said extraction step comprising the sub-steps of:
- motion estimation between two images of said sequence, so as to obtain said at least one watermarked motion vector;
- analysis of the position of said watermarked motion vector in a reference space, partitioned into two zones types of complementary types zones, one zone surrounding the other zone, each zone having of which has a distinct binary value associated with it;

- the assigning to said watermarking bit of the binary value of the zone in which said motion vector is located.

16. (Original) A method of extraction according to claim 15 wherein, an image of said video sequence being associated with at least two hierarchical levels, said method implements said motion estimation on at least one pair of images of said sequence for at least one of said levels so as to determine a set of motion vectors of said level,

and wherein the motion vector of a higher hierarchical level is obtained by computing an average of the associated motion vectors in the lower level.

17. (Original) A method of extraction according to claim 15, wherein, said watermarking bit being inserted redundantly into said video image sequence, said method of extraction comprises a step for the computation of at least one correlation coefficient used to assign an index of trust to said extracted watermarking bit.

18. (Currently Amended)   A device for the watermarking of a video image sequence, comprising means for the insertion of at least one watermarking bit into at least one motion vector obtained by motion estimation between two images of said sequence, so as to obtain at least one watermarked motion vector,

said motion vector being identified by its coordinates in a reference space, partitioned into two zones types of complementary types zones, one zone surrounding the other zone, each zone of which has having a distinct binary value associated with it,

said insertion means comprising means, activated if necessary, for the modification of the coordinates of said motion vector so that it is located in a binary value zone corresponding to said watermarking bit to be inserted,

wherein said modification means comprise means for determining at least two potential watermarked motion vectors and for the selection, from among said potential watermarked motion vectors, of an optimal watermarked motion vector, according to at least one

predetermined criterion, so that the modified coordinates of said motion vector are those of said optimal watermarked motion vector.

19. (Currently Amended)   A device for the extraction of a watermark from a sequence of video images watermarked according to the watermarking device ~~method~~ of claim [[1]] 18, comprising means for the extraction of at least one watermarking bit inserted into at least one watermarked motion vector, said extraction means comprising means of:

- motion estimation between two images of said sequence, so as to obtain said at least one watermarked motion vector;
- analysis of the position of said watermarked motion vector in a reference space, partitioned into two zones ~~types~~ of complementary types ~~zones~~, one zone surrounding the other zone, each zone having ~~of which has~~ a distinct binary value associated with it;
- the assigning to said watermarking bit of the binary value of the zone in which said motion vector is located.

20-21. (Cancelled)

22. (Currently Amended)   A computer readable medium ~~program product~~ comprising program code instructions recorded thereon, ~~in a carrier~~ that can be used in a computer, comprising:

- computer-readable programming means to perform a step for the insertion of at least one watermarking bit into at least one motion vector obtained by motion estimation between two images of said sequence, so as to obtain at least one watermarked motion vector, said motion vector been identified by its coordinates in a reference space, partitioned into two zones ~~types~~ of complementary types ~~zones~~, one zone surrounding the other zone, each zone having ~~of which has~~ a binary value associated with it;
- computer-readable programming means to perform a step for the modification, if necessary, of the coordinates of said motion vector so that it is located in a binary value

zone corresponding to said watermarking bit to be inserted;

- computer readable programming means to perform a step for determining at least two potential watermarked motion vectors and a step for the selection, from among said potential watermarked motion vectors, of an optimal watermarked motion vector according to at least one predetermined criterion, so that the modified coordinates of said motion vector are those of said optimal watermarked motion vector.

23-24. (Cancelled)

25. (New)   A computer-readable medium comprising program code instructions recorded thereon, that can be used in a computer, comprising:

- computer-readable programming means to perform a step of extraction of at least one watermarking bit inserted into at least one watermarked motion vector,

- computer-readable programming means to perform a step of motion estimation between two images of a watermarked video image sequence, so as to obtain said at least one watermarked motion vector;

- computer-readable programming means to perform a step of analysis of the position of said watermarked motion vector in a reference space, partitioned into two zones of complementary types, one zone surrounding the other zone, each of which has a distinct binary value associated with it; and

- computer-readable programming means to perform a step of assigning to said watermarking bit of the binary value of the zone in which said motion vector is located.